

# When demand-side management competes in an electric resource solicitation

## Issues from a case study in New York

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*In this study we analyse a New York utility's integrated bidding programme, focusing on the techniques used to incorporate demand-side management (DSM) options. The utility relied on a two-stage bid evaluation process. In the first stage, an objective self-scoring system was employed, where points were awarded for price and other attributes of DSM and supply proposals. A short list of projects was selected, which were then subjected to more detailed analysis by the utility. Several additional screening criteria were used in the evaluation of DSM bids, including technical and economic feasibility, riskiness, and potential impact on the company's own DSM programmes. Out of the 33 DSM bids originally submitted (for a total of 163 MW), 30 made it through the first stage, but only seven survived the second stage (for a total of 36 MW). The scoring system did not effectively discriminate among or adequately value DSM bids, primarily because it was designed to evaluate supply-side projects. In the second stage, the utility evaluation process was too stringent in eliminating DSM bids that potentially competed with utility DSM programmes or overlapped with other DSM bids. To avoid these problems in future solicitations conducted by this or other utilities, we recommend that separate auctions be held for supply and demand resources, that DSM bid evaluation criteria be tailored to the characteristics of the DSM resource, that contract negotiations be more heavily relied upon to resolve issues between the utility and bidders, and that*

*utilities consider partnerships between themselves and third-party DSM providers in implementing their DSM programmes as an alternative to bidding programmes such as the one discussed here.*

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American electric utilities have been challenged by the cross-currents of recent structural and regulatory changes in their industry. Traditionally operated as regulated, vertically integrated monopolies, electric utilities are now being nudged into competition with private entities for the right to build future power-generating facilities. Traditional supply-side planning has been supplanted by integrated resource planning, where the scope has been broadened to include consideration of demand-side management (DSM) resources, of the environmental consequences of resource options, and of the uncertainties and risks inherent in alternative expansion paths.<sup>1</sup> In many jurisdictions, electric utilities are being cajoled (through regulation) and enticed (through financial incentives) to deliver DSM programmes on a scale that is comparable to most planned electric supply additions over the next decade.<sup>2,3</sup>

As utilities translate integrated resource planning into resource acquisition strategies, a key issue that arises is how best to structure and manage competition. Integrated solicitations, where supply and demand resources are bid and evaluated on a comparative basis, are seen by many as a way to simultaneously promote the goals of integrated resource planning, spur further implementation of DSM, and achieve the economic efficiency advantages of competition.

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Since the first requests for proposals in 1984, auctions for electric resources have been both prolific and varied. By 1992, over 60 electric utilities in 26 US states have instituted nearly 100 solicitations requesting over 22 GW of power. For the subset of utilities that have announced results, 14 GW of supply-side projects and 275 MW of demand-side projects have been selected. In 20 states, bidding has been restricted to private power producers (that is, supply projects). Firms or customers that offer DSM options have been included as part of integrated or 'all-sources' bidding solicitations of utilities in five states (Maine, New Jersey, Indiana, Washington, and New York). In several states, utilities have also issued demand-side only requests for proposals or developed parallel but separate bidding processes for supply and DSM resources.

The state regulatory environment has, to a great extent, shaped DSM bidding programmes in the USA, and the state of New York is no exception. In response to forecasted needs for additional capacity by the early to mid 1990s, the New York Public Service Commission (NYPSC) directed utilities, in a flurry of decisions over two years, to file long-range DSM and integrated resource plans, to implement bidding programmes, to offer full-scale, system-wide DSM programmes to various customer classes, and to suggest ratemaking mechanisms that would overcome financial barriers to promoting energy efficiency options. The NYPSC consciously chose to implement bidding quickly in the spirit of experimenting with this alternative form of resource acquisition. The NYPSC provided general guidelines on bidding but it was left to the utilities to sort out and ultimately reconcile the consequences of these DSM policy initiatives with bidding guidelines that required inclusion of demand-side providers.

In compliance with the Commission's bidding orders, the Niagara Mohawk Power Corporation issued its first integrated bidding request for proposals for 350 MW.<sup>4</sup> This paper focuses on the process and issues that arose out of the DSM bid evaluation portion of Niagara Mohawk's integrated resource solicitation. For insight into other aspects of this solicitation, including more background on the regulatory history of bidding in New York and analysis of the supply-side bid-evaluation process, the reader is referred to the full report.<sup>5</sup>

### Bid evaluation process and outcome

Niagara Mohawk's solicitation called for both supply and demand projects to be evaluated together in an integrated auction. By design, there was no *a priori*

**Table 1. Point values in Niagara Mohawk scoring system.**

Factor	Score	Percentage of total
Price	850	65
Economic risk	75	6
Success	64	5
Longevity	21	2
Performance (demand) or operational (supply)	80	6
Environmental	220	17
Total possible points	1310	100

allocation of the resource block between the two types of resources. Theoretically, Niagara Mohawk could have filled the entire capacity block with either supply or demand projects.

Niagara Mohawk relied on a two-stage bid-evaluation process. The rationale for this approach was to partake of the advantages of an objective, self-scoring system that was relatively transparent to bidders to produce a 'short list' of projects. The remaining projects would then be analysed in more detail in a second stage using modelling and analysis methods established by Niagara Mohawk. Phase 2 allowed for significant utility discretion in choosing the best combination of projects.

#### *Phase 1: Objective, self-scoring system*

In the first phase, developers submitted sealed bids to an independent third-party firm which ranked them based on total points established for various attributes and selected an initial award group of projects. The primary structure and point values of the Phase 1 scoring system were the same for both supply and demand-side resources (see Table 1). The number of points assigned to various attributes represents the relative weighting or valuation of that factor in choosing among projects. Factor point assignments reflect one outcome of the bidding programme development process in which many parties participated, including regulators, intervenors, and utility staff.

#### *Phase 2: Bid evaluation process*

In the second phase, Niagara Mohawk evaluated projects in the initial award group independently from one another and in combination with other projects under different scenarios about future load growth, fuel prices, and expectations of non-utility generation. DSM projects were analysed using additional screening criteria. DSM projects were not rejected or accepted until the complete analysis had been performed but it is apparent that Niagara Mohawk placed more weight on some decision

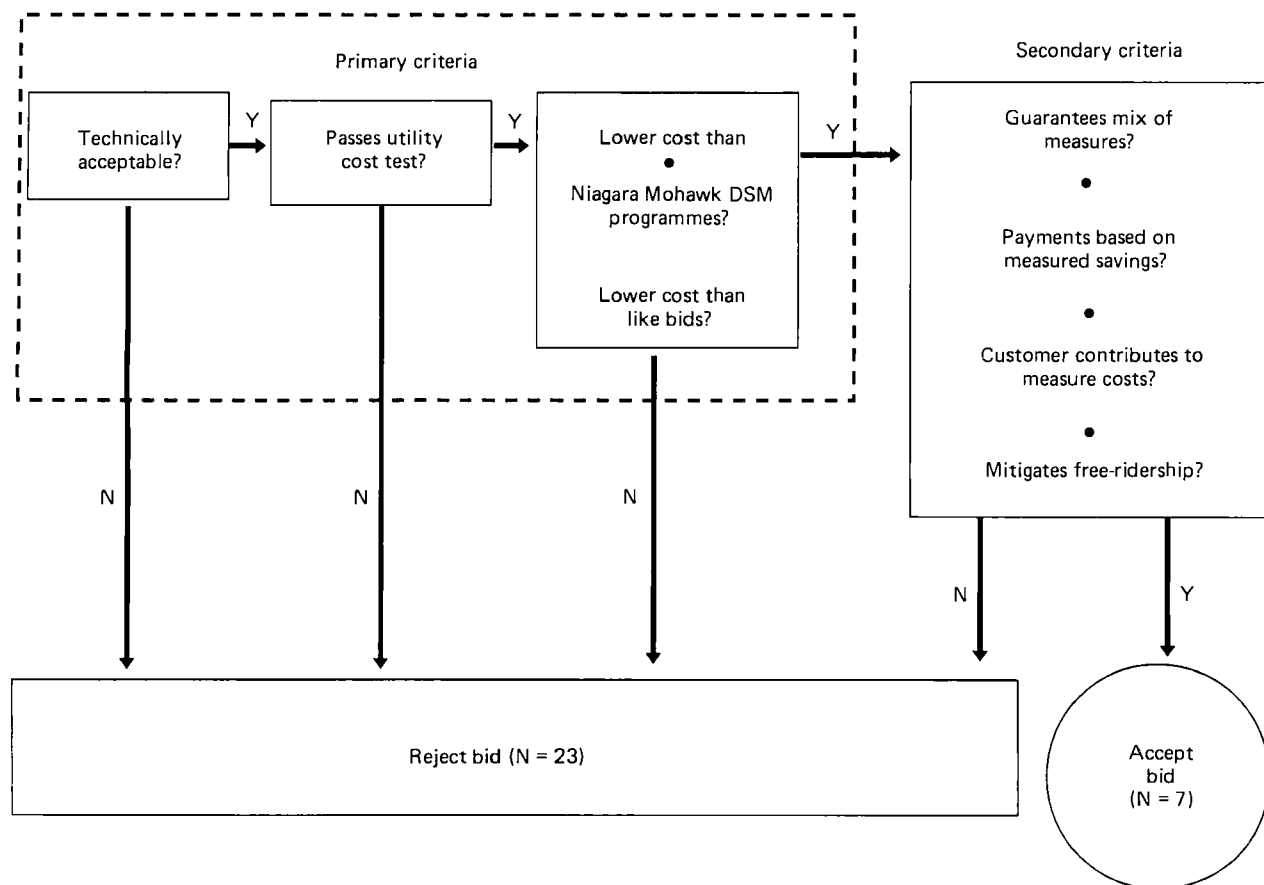


Figure 1. Decision rules applied to DSM bids.

criteria than others. Figure 1 represents the process by which DSM bids succeeded or failed in Phase 2 based on a synthesis of several sources and our own judgement.<sup>6</sup> In this figure, decision rules are classified as *primary* or *secondary* criteria. DSM bids passing the individual project screening were combined together into a portfolio of projects in order to ensure their cost-effectiveness as a group. The group of DSM projects were then put together with initial award group supply projects in various combinations to form portfolios in sizes ranging from 450 MW to 550 MW. It is important to note that the group of DSM projects was to remain invariant during the integrated bid-evaluation process. The cumulative capacity of projects picked for the final award group was to be at least 125% (that is, 438 MW) of the resource block requirement, apparently to allow for the 'lumpiness' of projects, and for attrition in the contract negotiation phase.

#### Response to the solicitation

Niagara Mohawk received 108 bids, totalling nearly 7300 MW. Thirty-three DSM bids were submitted for a total of 163 MW. Of the 75 supply bids offered,

26 were multiple bids at the same site, but with lower scores, leaving 49 unique supply projects. Even so, the supply-side capacity offered from this latter subset dwarfed the demand-side, at 4700 MW.

Figure 2 shows Phase 1 scores for DSM and supply bids. On average, DSM bids garnered 798 points out of a total of 1310. Over half of these points derived from price factor scores. In the non-price factor categories, most of the points came from the environmental factor, where 100% of the possible points were achieved by conservation projects. DSM bids captured from two-thirds to three-quarters of the possible points on other non-price attributes.

The principal distinction between DSM and supply projects was on bid price: the mean price score for DSM bids was 410 points, whereas for supply bids it was 118 points. This advantage on price is the principal reason that DSM projects scored almost twice as many points on average (452 vs 798) overall compared with supply projects. In addition, DSM projects also had a significant edge on environmental factor scores (58 points) compared with generation projects. Interestingly, average scores on other non-price factors were comparable between supply and DSM projects.

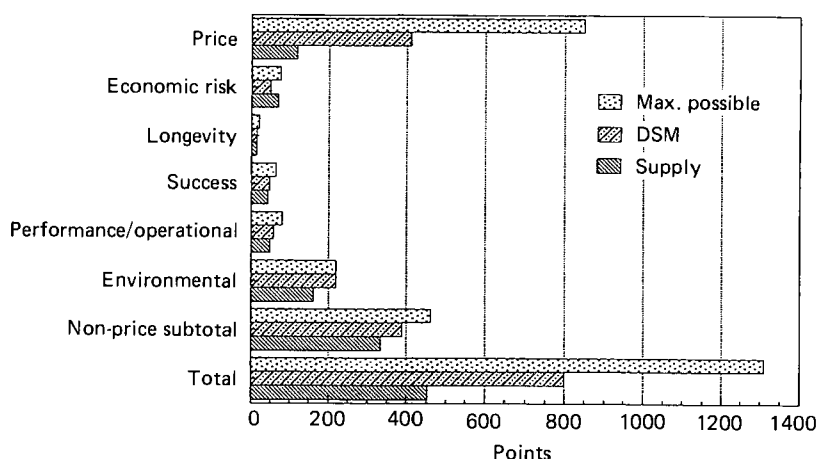


Figure 2. Average bid scores in Niagara Mohawk solicitation.

### Initial and final award group

The initial award group comprised 39 bids: 30 DSM bids for 140 MW and nine supply bids for 972 MW. On the demand side, all but three, or 91% of the bids passed the Phase 1 screen. On the supply side, the situation was quite different: only 18% of the bids were selected for the initial award group.

Niagara Mohawk's final award group ultimately comprised seven DSM projects offering 36 MW of demand reductions and two large supply projects (189 MW coal-fired repowering project and 216 MW gas-fired combined cycle). Table 2 shows the DSM bids in the final award group, including type of bidder (eg energy service company (ESCO) or customer), the savings level, targeted market sectors and end use efficiency measures, and desirable features cited by Niagara Mohawk in selecting these projects.

Twenty-three initial award group DSM bids were ultimately rejected. Patterns clearly emerged as to the bid attributes that caused the most concern to the utility.<sup>7</sup> For example, the sole reason given for

rejecting all five commercial/industrial (C/I) lighting bids was their high price relative to Niagara Mohawk's DSM programme costs. Niagara Mohawk stated that ESCO bid prices for C/I lighting programmes were substantially more expensive than estimated costs per kWh saved of the company's C/I lighting programme (\$0.058–0.079/kWh vs \$0.02–0.03/kWh). Niagara Mohawk claimed that the seven projects that proposed comprehensive retrofits in the commercial/industrial sector were rejected because they failed to pass one or more of their primary criteria (for example, more expensive than a comparable Niagara Mohawk DSM programme). Most strikingly, all but one bid failed two secondary criteria, those of not guaranteeing a mix of measures and not requiring participating customers to pay some portion of the incremental costs of the energy-saving measures. Finally, Niagara Mohawk rejected five residential sector bids primarily because these projects failed the utility cost test, and secondarily because the company believed that the savings estimates were overly optimistic.

Table 2. Final award group DSM bids.

	MW	Sector/measures	Desirable features
ESCO 1	7.7	C/I HVAC, lighting, motors	Lowest cost in category, high customer contribution
ESCO 2	5.1	Res. 2nd refrigerator removal	No overlap with Niagara Mohawk programmes, limited free riders
ESCO 3	5.8	Multi-family comprehensive retrofit	No overlap with Niagara Mohawk programmes
ESCO 4	8.0	Res. lighting, DHW, envelope	Comprehensive package
ESCO 5	8.0	Res. lighting, DHW, envelope	Comprehensive package
Customer 1	1.1	Industrial lighting	Attractive even assuming free-rider
Customer 2	0.3	Industrial compressed air controls	Attractive even assuming free rider

## Issues in the solicitation

### *Scoring system failed to value DSM bids properly*

One clear shortcoming in the Phase 1 scoring system was its inability to discriminate effectively between DSM bids. This problem was principally a by-product of Niagara Mohawk's decision, in response to policy directives of New York's regulators, to conduct an integrated auction with supply and DSM resources competing against one another. The scoring system for DSM bids was patterned after, and essentially mimicked, the categories and relative weights of its supply-side bid evaluation. The problems for DSM projects were most glaring in the scoring approach for non-price factors. For example, the experience of the DSM project team was worth only 3% of the total points, which seems low given the relative immaturity of the energy services industry. Likewise, the ability to measure, verify and guarantee savings of installed measures is an extremely important distinguishing characteristic among DSM bidders, yet DSM bidders could obtain a maximum of only 2% of the total non-price points if payment was based on metered savings, and another 2% if they guaranteed a specified amount of savings documented through metering. These weights also seem quite low, particularly in view of the fact that Niagara Mohawk emphasizes measured savings based on impact evaluations in its long-range DSM plan as well as the structure of its shareholder incentive mechanism.

### *Balancing economic perspectives*

In the Phase 1 scoring system, payments from the utility plus proposed customer cost contribution relative to the published long-run avoided costs were used to determine a DSM bidder's price score. This approach is analogous to the total resource cost test used in the economic evaluation of DSM programmes. In its Phase 2 evaluation, Niagara Mohawk analysed the economic feasibility of each DSM bid using various cost-benefit tests that have become customary in assessing the merits of utility conservation programmes.<sup>8</sup> Niagara Mohawk was particularly concerned about the costs of DSM bids to the utility, and eliminated bids that failed the utility cost test using their lower internal estimates of marginal costs. However, Niagara Mohawk's heavy reliance on the utility cost test in Phase 2 clearly was a departure from the scoring signal on price implied by the sole reliance on the total resource cost test in Phase 1. There should also be an explicit linkage between the approaches used to conduct the economic evaluation in the two phases. If the utility

intends to rely solely on the utility cost test, then bidders must know this prior to submitting bids so that they can design their proposals to maximize customer contribution.

It is not obvious that this approach was appropriate in the context of an integrated auction because some DSM bids that were screened out on the basis of their cost to the utility (in comparison with other similar bids or company-sponsored DSM programmes) may still have been cheaper than the supply-side resource alternatives. Additionally, because Niagara Mohawk's rebate programmes are structured so as to pay only a fraction of the incremental measure costs, they will look better than DSM bids if only the utility cost test is used. In effect, the economic merits of DSM bids are judged against the utility's rebate levels and administrative costs. However, Niagara Mohawk should have placed some weight on the overall cost to society (as measured by the total resource cost test), and not just the costs to the utility.

Incorporating the manifold cost-benefit perspectives characteristic of DSM resources into a self-scoring system is admittedly a non-trivial challenge. Other possible options for evaluating the economic benefits of DSM bids include:

- using the total resource cost test as a threshold (for example, must be greater than one) and relying solely on the utility cost test;
- using a combination price metric which includes some explicit weighting of total resource and utility cost tests (50/50 has been proposed by regulatory staff in California);<sup>9</sup>
- maximizing total resource net benefits per dollar of utility investment (that is, total resource cost net benefits/utility programme costs);
- establishing a ceiling price, which is arbitrarily set lower than the utility's avoided cost, using some other rationale (for example, consistency with utility rebate levels).

Whatever approach the utility follows, at a minimum it must be able to assess and properly value the additional services and performance risks being borne by DSM bidders relative to utility rebate programmes.

### *ESCO vs ESCO competition*

The Phase 2 DSM bid-evaluation process effectively pitted similar ESCO bids against one another. Niagara Mohawk's approach for grouping and comparing bids that targeted similar customer classes and end uses is reasonable because of the potential risk to the utility, ratepayers, and even winning

bidders from taking too many DSM bids that target the same market segment. However, we think Niagara Mohawk over-reacted by rejecting all but the least-cost ESCO bid. This problem arose especially among ESCOs that proposed multiple measures in the commercial/industrial sector. One of the reasons that Niagara Mohawk gave for eliminating ESCO bids in this category was that the cost to the utility was significantly higher than the lowest price bid.

We feel that this decision criterion was too restrictive because the C/I sector is not homogeneous, and ESCOs offering multiple measures conceivably developed their programme designs to target various C/I market segments and ownership patterns (for example, offices, hospitals, public institutions vs private sector). The winning bid in this sector targeted institutional and public buildings. The project designs of other ESCOs may well have addressed market barriers that exist among different types of commercial and industrial customers, which, in turn, was reflected in their estimates of customer contribution. For example, customers that own large office buildings may have higher investment hurdle rates than public institutions that may have long-term perspective but much more limited access to capital.

#### *Competition between DSM bidders and utility DSM programmes*

Assessing the potential for market overlap between bidder's projects and other company DSM programmes was an important element of Niagara Mohawk's Phase 2 bid-evaluation process. The company was most concerned about programmes proposed by ESCOs, and there is relatively little overlap between bids selected for the final award group and other company DSM programmes. For example, one bidder's refrigerator round-up programme did not overlap with any Niagara Mohawk DSM programme in terms of end uses and sectors targeted. In other cases, winning ESCO bids occupy market niches, such as a bid for low-income multifamily, in which Niagara Mohawk has not been particularly active.

The large C/I sector was the prime example in which Niagara Mohawk had to manage the potential for significant overlap between DSM bidding and other utility DSM programmes, which were mandated by the NYPSC. The one winning proposal in this sector focused on large institutional customers that were also eligible to participate in Niagara Mohawk rebate programmes for certain measures (such as high-efficiency lighting, motors and HVAC). However, the company decided that this

bidder's programme design, which required substantial customer contribution to the cost of the retrofit, would not undercut their C/I rebate programs. The company rejected other DSM bids that targeted C/I customers, even though many of the ESCOs were quite experienced in this sector, and the company acknowledged that many of their bids were attractive. Niagara Mohawk adopted a very conservative posture in selecting only one ESCO that targeted C/I customers, even though the company had little actual experience implementing DSM in this sector (though at the time they had proposed several new C/I rebate programmes for high-efficiency motors and HVAC).

At a minimum, Niagara Mohawk could have accepted several other proposals with contingencies and then addressed their concerns during contract negotiations. Ultimately, the regulators have to share much of the responsibility for the problems that arose because the NYPSC provided insufficient policy guidance to the utilities who were left to grapple with potential conflicts between NYPSC-mandated core DSM programmes and DSM bidders' proposals. With the benefit of hindsight, it is also clear that Niagara Mohawk could have been more explicit in the request for proposals that this criterion would weigh heavily in the bid-evaluation and selection process.<sup>10</sup>

#### *Treatment of measure mix risk on ESCO bids*

Niagara Mohawk overreacted to the measure mix risk in ESCO bids. In some cases, the project sponsor proposed payment based on an average cost of the bundle of measures but made no guarantee concerning what measures would actually be implemented. The company characterized these proposals as high risk, and listed this as one of the factors given for rejecting bids. While their concern on this type of bid was legitimate, they could have responded differently. It is not clear why this issue could not have been handled and resolved by additional contractual negotiations among the parties in the event that the DSM project was selected for the final award group. Some ESCOs might have been willing to negotiate on this issue, either offering to tie their payments to achievement of an agreed mix of DSM measures or some adjustment to the payment mechanism if the actual mix of installed measures differed significantly from that anticipated by the ESCO in their bid price. These projects could have been included in the final award group conditionally, pending satisfactory resolution of this issue.

### *A moving target: use of updated avoided costs*

Niagara Mohawk's cost-benefit analysis in Phase 2 relied on the company's internal estimates of marginal costs, which were significantly lower than the NYPSC-approved long-range avoided costs (LRACs) that were published in the request for proposals and employed in the Phase 1 bid scoring. The NYPSC-approved LRACs are utilized in evaluating the benefits of utility-sponsored DSM programmes. Many bidders believed that Niagara Mohawk would perform its economic analysis using the avoided costs published in the request for proposals. Thus, at a minimum, in the future, the company needs to indicate more clearly how published avoided costs will be used for bid evaluation and ensure that the process is consistent with economic evaluation of its own DSM programmes.<sup>11</sup>

However, this will not fully solve all problems because there is always the possibility that avoided costs could change significantly between the time the request for proposals is issued and the utility evaluates bids, because of external factors such as a collapse in world oil prices, or reduced demand because of recession. In fact, changed conditions is the primary reason given by Niagara Mohawk for claiming that the NYPSC-approved LRACs were outdated. In the future, it would be useful for the parties to develop guidelines specifying procedures and conditions that would be required in order for the utility to update its estimate of avoided costs. In addition, the NYPSC and the utility might want to consider allowing DSM bidders to negotiate on price in the event that avoided costs change significantly after the request for proposals is issued. Otherwise, DSM bidders will always be at a disadvantage compared with the utility's DSM planners and programme managers who are able to modify rebate levels periodically (if necessary) based on updated information on avoided costs, so that programmes may pass the utility cost test.

### *Limited scope of portfolio analysis*

Niagara Mohawk precluded the possibility of expanding the DSM role in its integrated portfolio analysis. The company followed a staged approach in Phase 2 in screening DSM bids first, then combining the winning DSM bids into a group as a fixed input to the portfolio analysis with supply bids. The single DSM portfolio of 36 MW was invariant in the portfolio analysis, and there was never any meaningful comparison of *marginal* DSM with marginal supply projects. Such comparisons could have produced smaller total portfolios. Given the apparent

high probability assigned to the low-need scenario by the utility,<sup>12</sup> it is entirely possible that a portfolio with greater DSM would have been superior to the chosen portfolio.

## **Policy recommendations**

### *Separate DSM and supply auctions are preferable*

There are several key differences between DSM and supply resources, in terms of market structure, inherent characteristics and level of development, which are germane to bidding. First, the market for energy efficiency is ultimately a retail market, while the competition for private power contracts is a wholesale market.<sup>13</sup> Second, on the supply side, there is a well-developed infrastructure of private power developers that has led to project offerings that greatly exceed requested needs of utilities. The individual contracts are typically for single projects and locations, providing a product that can be directly measured and is well understood by utilities because they have decades of experience operating similar projects. Utility managers are relatively confident that a supply-side project's interaction with the utility system can be predicted and managed.<sup>14</sup> In contrast, compared with the private power industry, the energy services industry is relatively immature (although growing rapidly). ESCOs essentially perform an aggregation function that transforms demand-side opportunities at individual sites into a product of 'saved energy'.

Third, provision of saved energy typically involves a complex relationship among customers, the ESCO, and the utility. Within a particular demand-side market and/or end use, individual bidders and the utility's own programmes are all mining the same resource. Individual DSM bids could have a negative impact on other DSM bidders' ability to deliver their projected savings as well as the utility's ability to obtain savings goals through its own programmes. Thus, DSM bidding must be well coordinated with other utility DSM programmes. If utilities are unable to work out creative solutions, then regulatory determinations will be required to address and define which entities can most appropriately deliver utility DSM programme offerings in various market segments. Fourth, the output of demand-side resources can never be measured with the same degree of certainty as supply-side resources.<sup>15</sup>

Differences between supply-side and DSM resources argue for procurement processes that are specifically tailored to evaluate the attributes and distinctive features of each resource. In practice, this can be accomplished most easily by designing sepa-

**Table 3. Competitors in alternative bidding approaches.**

Bidding approach	ESCOs	Planned utility DSM programme	Planned utility supply project	IPPs
Partnership bidding	X			
Replacement bidding				
Demand-side only	X	X		
Integrated (supply-side vs ESCO)	X		X	X
All-sources bidding	X	X	X	X

Source: Adapted from D. Schultz, *Report on the Demand-side Bidding Proposals of Southern Californian Edison, Southern Californian Gas, and San Diego Gas & Electric*, OII 91-08-002, 6 April 1992.

rate procurement processes for DSM and supply-side resources with distinctive scoring systems.

### *Partnership as an alternative to replacement DSM bidding*

In deciding how to structure demand-side procurement processes, the role(s) of ESCOs need to be more clearly linked to policy goals, which are then reflected in programme design. Utilities have traditionally contracted out some element of their DSM programmes by soliciting bids to private sector firms using conventional competitive procurement processes to buy energy services. As currently structured, most DSM bidding programmes stretch the boundaries of third-party involvement from procuring energy services to provision of saved energy through long-term contracts. The obvious competition occurs among energy service companies in DSM bidding programmes, although it is clear that ESCOs are also competing in a less explicit fashion against other utility-sponsored DSM programmes.<sup>16</sup>

Policy and programme objectives mentioned by proponents of DSM bidding (and sometimes embraced by regulators) include the following:

- Experiment with alternative delivery mechanisms compared with conventional utility-run DSM.
- Promote the development of an 'infant' energy services industry.
- Encourage performance-based DSM programmes in which DSM savings are guaranteed and maintained over the long term.
- Provide a competitive benchmark to help to assess utility DSM performance in terms of programme cost, cost-effectiveness, and development of DSM market potential.

Conceptually, *replacement* and *partnership* bidding represent alternative approaches, which help to link policy choices regarding the role of ESCOs to the four overall programme objectives listed previously.

Table 3 illustrates who the possible competitors would be under alternative competitive resource acquisition frameworks.

*All-sources bidding* represents the most general form of replacement bidding in which all options, supply- and demand-side, and providers (utility and non-utility) would compete explicitly. In this theoretical construct, the resource-acquisition process largely obviates the need for identifying the avoidable plant or potential utility DSM programmes in the planning stage.<sup>17</sup> *Integrated bidding* is another form of replacement bidding in which ESCOs compete alongside independent power producers to displace some or all of a planned utility supply-side project. Unlike all-sources bidding, planned utility DSM programmes are not explicitly considered as resources that can be replaced in this type of bidding programme. One goal is to determine whether ESCOs can provide energy services at a lower cost than independent power producers or planned utility supply-side additions. Utilities in New York, Maine and New Jersey have conducted this latter type of bidding programme. The utility is typically placed in the position of deciding whether ESCO bids would adversely affect planned utility DSM programmes. Integrated auctions can be made to work if substantial negotiations and flexibility are built into the process, although bid evaluation is more difficult.

In *demand-side only replacement bidding*, there is an explicit competition between a utility's own DSM programmes and ESCO activities. A primary objective is to have ESCO bids provide a price check on the utility's estimated or actual DSM programme costs. In effect, ESCOs serve the functional role that independent power producers perform on the supply side. Competition between ESCOs and the utility's DSM programme could occur at several possible stages:

- resource acquisition and selection: using an auction to compare ESCO bids with a planned



utility programme and selecting the lowest-cost alternative;

- implementation: explicit competition in the field between utility DSM staff and designated ESCOs in certain markets and end uses.<sup>18</sup>

In the first approach, the utility would not offer its own DSM programme, if it determined that the ESCO could deliver comparable services more cost-effectively. This approach is being tested by at least one utility in California at the insistence of the Public Utilities Commission.<sup>19</sup> Some proponents envisage that this type of DSM-only replacement bidding would be formalized with planned utility DSM programmes being put out for bid on a regular basis. However, this scheme is untested and, because of its emphasis on minimizing costs, would require careful specification of all features and desired services. This approach might be appropriate for certain mature DSM programmes or technologies. Madison Gas & Electric's Competition Pilot Programme is an example of the second demand-only replacement bidding approach which features head-to-head competition in targeted market segments.<sup>20,21</sup> The Wisconsin regulators ordered the competition because they were dissatisfied with the pace at which Madison was developing its DSM resource. However, we are sceptical that short-term competitions between utilities and ESCOs are a viable long-term approach.

In contrast to replacement bidding, *partnership bidding* embodies the concept that utilities and ESCOs agree to work cooperatively to develop the DSM resource. In this approach, there is the recognition of a joint mission between utility and ESCO – that the ESCO in effect acts as an agent of the utility in its DSM programmes – and an accommodation of the operating requirements between the two parties. Partnership bidding represents opportunities for ESCOs to extend and expand on the type of activities offered, including provision of saved energy or comprehensive delivery of energy services under performance contracting arrangements. Partnership bidding programmes are more likely to emphasize qualifications, experience, performance guarantees for savings, customer relations, comprehensiveness and value of services rather than price. The principal aspect of competition is among ESCOs during the selection phase. Ironically, it may be easier to develop partnership bidding in situations where utilities conduct few DSM programmes or their offerings are not comprehensive across all customer classes or market segments.<sup>22,23</sup>

In most situations, we believe that partnership bidding types of programme are the preferred approach for procuring DSM resources given the

relative immaturity of the ESCO industry and the difficulties of structuring effective competitions among ESCOs and utilities. It is still unclear whether the most effective way to utilize ESCO capabilities is to have them offer saved energy, or to bid costs for specified services with selection based primarily on qualifications and prices. Most parties involved with DSM bidding would agree that much more experimentation is needed to determine the most effective way to utilize ESCO capabilities. However, the viability of ESCO-utility partnership arrangements hinges on the utility's ability to resolve satisfactorily potentially thorny market-share conflicts at the planning and/or implementation stages. State regulators have significant responsibilities in this area and, at a minimum, must ensure (as they have in New York) that utility management does not have a financial incentive to pursue utility-sponsored DSM programmes at the expense of third-party-delivered DSM programmes.

#### *Tailor bid evaluation to match DSM resources*

DSM bidders could have been sent clearer signals regarding the company's true preferences (as demonstrated in its Phase 2 evaluation) if the initial DSM scoring criteria were developed separately from supply-side projects. Future bid evaluation criteria should be revised to facilitate comparisons between different DSM projects. It makes little sense to use similar weights in the major non-price categories for supply-side and demand-side options. This approach emphasizes form over content, in an attempt to ensure consistent treatment of all resource options. At this early stage of development, the design of DSM competitive procurements and bid-evaluation criteria should emphasize those factors that are critical to the deployment and achievement of long-term demand and energy savings: reasonable bid price, qualifications and experience of firms, technical expertise in installing and maintaining DSM technologies, market research and programme design tailored to customer needs, types of financing arrangements offered to customers, and plans for measuring and verifying energy savings.

#### *Customer options: utility DSM programmes or custom bidding programs*

In contrast to an ESCO's bid and marketing plan, bids submitted by customers typically contain detailed, site-specific DSM options. Thus the level of resource definition is greater with fewer uncertainties. However, based on interviews with customers, Niagara Mohawk staff, and the experience of other utilities, it is clear that few customers are likely to

participate in DSM bidding programmes given the high transaction costs associated with preparing bids and relative risks compared to other DSM programmes. It is possible that simplified bidding processes can be developed which will increase participation of large customers, but it is not clear that this is likely or, more importantly, even desirable.

The type of business relationship embodied in signing long-term contracts for saved energy places utilities in a difficult position *vis-à-vis* their customers. No utility wants to have an adversarial relationship with its customers, and it is clear that during 'arms-length' contract negotiations, parties are obligated to bargain hard. In negotiating with customers directly, the utility presumably has multiple objectives, among which cost-effective resource procurement and enhancing customer service are quite important. Unfortunately, these two objectives can be in conflict, and it may be difficult for the regulator to discern whether the utility has in fact negotiated effectively to drive a hard bargain that protects ratepayers. Because bid price is fixed, we would expect these conflicts to be fairly subtle and to arise principally in negotiations over terms and conditions (for example, measurement and verification, performance risk, actions that will be taken if circumstances at the customer's facility change significantly). Ironically, contract terms and conditions with ESCOs may be the only yardstick that regulators have to ensure that no 'sweetheart deals' with customers have been consummated.

Ultimately, given limited customer participation and potential headaches for utilities (in terms of customer relations) and regulatory commissions (in terms of determining prudence), it may turn out that bidding-type programmes are most suitable for third-party entities and that customers should be directed to other utility DSM programmes. Customized rebate programmes offered by some utilities may represent a hybrid approach because customers can bring forward site-specific proposals for more complex retrofits and receive prespecified financial incentives. These programmes are easier to participate in than bidding programmes, and typically have much lower transaction costs and performance risks.<sup>24</sup>

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<sup>1</sup>E. Hirst and C. Goldman, 'Creating the future: integrated resource planning for electric utilities', *Annual Review of Energy*, Vol 16, 1991, pp 19-121.

<sup>2</sup>National Association of Regulatory Utility Commissioners, *Profits & Progress Through Least-Cost Planning*, Washington, DC, 1989.

<sup>3</sup>Lawrence Prete, Janet Gordon and Linda Bromley, 'Electric utility demand-side management', *Electric Power Monthly*, Energy Information Administration, Washington, DC, April 1992.

<sup>4</sup>Niagara Mohawk Power Corporation, *Competitive Bidding Guidelines and Request for Proposals RFP No. 1*, Syracuse, NY, 20 November 1989.

<sup>5</sup>C.A. Goldman, J.F. Busch, E.P. Kahn, S.S. Stoft and S. Cohen, *Review of Integrated Resource Bidding at Niagara Mohawk*, LBL-31667, Lawrence Berkeley Laboratory, Berkeley, CA, May 1992.

<sup>6</sup>Sources include: Niagara Mohawk Power Corporation, *Recommendations Concerning the Selection of Projects in Niagara Mohawk's First Competitive Bidding Request for Proposals*, Syracuse, NY, 1990; Niagara Mohawk testimony to the NYSPC regarding the ESCO protest, 1991; draft report of process evaluation on Niagara Mohawk's DSM bidding programme, ERC Environmental and Energy Services Co, 1991; W.E. Hamilton and T.A. Flaim, 'Acquiring DSM resources through all-source bidding: lessons learned', *Proceedings of DSM Bidding: Status and Results*, Synergic Resources Corporation, Albany, NY, 1992.

<sup>7</sup>Niagara Mohawk Power Corporation, *op cit*, 1990.

<sup>8</sup>F. Krause and J. Eto, *Least-Cost Utility Planning: A Handbook for Public Utility Commissioners, Volume 2 - The Demand-Side: Conceptual and Methodological Issues*, National Association of Regulatory Utility Commissioners, Washington, DC, December 1988.

<sup>9</sup>D. Schultz, *Report on the Demand-side Bidding Proposals of Southern California Edison, Southern California Gas, and San Diego Gas & Electric*, exhibit in Order Instituting Investigation 91-08-002, California Public Utilities Commission, 6 April 1992.

<sup>10</sup>Hamilton and Flaim, *op cit*.

<sup>11</sup>Niagara Mohawk staff state that although company-sponsored DSM programmes are analysed using the NYPSC-approved LRACs, the programmes are also designed to be cost-effective using the company's internal estimates of marginal costs.

<sup>12</sup>Goldman *et al*, *op cit*.

<sup>13</sup>E. Kahn and C. Goldman, *The Role of Competitive Forces in Integrated Resource Planning*, LBL-30982, Lawrence Berkeley Laboratory, Berkeley, CA, October 1991.

<sup>14</sup>Pacific Gas & Electric, *DSM Pilot Bidding Project: DSM Bidding Policy, Objective and Incentives*, OII 91-08-002, 13 September 1991.

<sup>15</sup>From a planning perspective, while the output of generation resources is easily measured, there are significant uncertainties associated with the future cost and impacts of these resources (for example, variability in fuel prices, impacts on environment).

<sup>16</sup>Kahn and Goldman, *op cit*.

<sup>17</sup>Schultz, *op cit*.

<sup>18</sup>*Ibid*.

<sup>19</sup>San Diego Gas & Electric, *SDG&E Request for Proposals: Energy Efficiency and Customer Service Program for Existing Residential Customers (Draft)*, OII 91-08-022, 3 April 1991.

<sup>20</sup>Edward Vine, Odon De Buen, Charles Goldman and Ralph Pahl, 'Mandating utility competition', *Utilities Policy*, Vol 2, 1992.

<sup>21</sup>MGE's programme was a slight variant in that budgets were fixed, and the objective was to determine which parties, ESCO or utility, could deliver the maximum quantity of cost-effective savings.

<sup>22</sup>Public Service Company of Colorado, *Demand Side Management: 50 MW Bidding Program - Request for Proposal*, Public Service Company of Colorado, Denver, CO, 1990.

<sup>23</sup>Public Service Indiana, *Resource Bidding Program: Demand-Side Management*, Plainfield, IN.

<sup>24</sup>Pacific Gas & Electric, *Annual Summary Report on Demand-side Management Programs in 1989 and 1990*, March 1990.